North Carolina State and Local Government Metadata Profile for Geospatial Data and Services

North Carolina Geographic Information Coordinating Council
Statewide Mapping Advisory Committee
Metadata ad hoc Committee

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NCGICC

Contents

I. Introduction

A geospatial metadata record is information, presented in a standardized format, which describes a dataset that may represent street centerlines, address points, conservation land, or other features in a wide range of geographically referenced data. The North Carolina Geographic Information Coordinating Council (NCGICC) recognized the value of valid metadata and adopted the Federal Geographic Data Committee (FGDC) Content Standard for Digital Geospatial Metadata (June 8, 1994).

In recent years, the Statewide Mapping Advisory Committee (SMAC) recognized that most geospatial data managers lacked the time and resources necessary to learn and apply a metadata standard. To address the problem of missing or incomplete metadata records among state and local data publishers, the SMAC chartered an ad-hoc Metadata Committee in October 2012 to "recommend ways to expand and improve geospatial metadata in North Carolina that are efficient for the data producer and benefit data users in the discovery and application of geospatial data." The Metadata Committee developed a new standard for North Carolina and submitted a draft to SMAC in July 2014. After review and modification by SMAC and standing committees, in October 2014 SMAC recommended adoption by the Council.

With Council review and final editing, the Council adopted the "State and Local Government Metadata Profile" as the recommended metadata standard for North Carolina state agencies and local governments (**date**). The State and Local Government Metadata Profile is based on the ISO 191** suite of geospatial metadata standards. The International Organization for Standardization (ISO) is the world's foremost developer of voluntary international standards with more than 19,500 published standards and 162 member countries. By adopting the ISO series of standards, state agencies and local governments ensure that compliance will allow their metadata to be published and searched in a consistent manner by agencies, organizations, and individuals throughout the world. This new North Carolina standard is consistent with a statement on the website of the FGDC:

Most National Spatial Data Infrastructure (NSDI) stakeholders have long utilized the Content Standard for Digital Geospatial Metadata (CSDGM), which will continue to have a legacy for many years. International geospatial metadata standards are emerging in the community. …Since ISO 19115 and the associated standards are endorsed by the FGDC, federal agencies are encouraged to transition to ISO metadata as their agencies are able to do so. While the selection of appropriate standards is dependent on the nature of your metadata collection and publication process, ISO metadata should be considered an option now. It's recognized that the transition to ISO metadata will be occurring over the next few years.

II. Acknowledgments

This document was compiled by an ad-hoc committee comprised of metadata and GIS professionals representing municipal, county, state, and federal organizations. The ad-hoc committee operated under the supervision of the NCGICC's Statewide Mapping Advisory Committee (SMAC[1]) and was advised by metadata experts from the private sector, Urban and Regional Information Systems Association (URISA[2]), Federal Geographic Data Committee (FGDC)[3], and GeoDiscover Alberta[4]. Primary support and resources were provided by North Carolina's Center for Geographic Information and Analysis (NCCGIA[5]).

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Steve Averett, GISP, Chair, City of Greensboro
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David Giordano, North Carolina Center for Geographic Information and Analysis
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Doug Newcomb, United States Fish and Wildlife Service
Rachel Trent, North Carolina Department of Cultural Resources
Carter Vickery, GISP, Wake County Government
Sarah Wray, GISP, North Carolina Department of Transportation

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Chelsea Duncan, North Carolina Department of Transportation
Ryan Bowe, Urban and Regional Information Systems Association
Jordan Erker, GeoDiscover Alberta

Maintenance of this document, its related resources, and the specifics of the State and Local Government Metadata Profile will continue under the direction of NCCGIA. Inquiries should be directed to NCCGIA staff.

[1] http://www.ncgicc.com/Default.aspx?tabid=142
[2] http://www.urisa.org/
[3] https://www.fgdc.gov/
[4] https://geodiscover.alberta.ca/geoportal/catalog/main/home.page
[5] http://www.cgia.state.nc.us/Home.aspx

III. Value of Compliant Metadata

Metadata is a set of information that captures and describes the basic characteristics of a data set or an information resource. The metadata record describes the 'who, what, when, where, why and how' of the associated data. Geospatial metadata is commonly used to document geospatial data sets but can also be used to document geospatial resources including mapping applications, data models, and web based services. Metadata records include core library catalog elements such as title, abstract, and publication date; geographic elements such as spatial extents and projection; and database elements such as attribute label definitions and attribute domain values.

Metadata allows users of geospatial data to find the information and data they need and determine how best to use it. Metadata facilitates:

Data Management

- Preserve data history so the data can be re-used or adapted
- Assess the age and character of data holdings to determine which data should be maintained, updated, or deleted
- Instill data accountability by requiring the producer to state what is known about the data and what is not known
- Limit data liability by explicitly designating the effective and administrative limits of use of the data

Project Management

- Plan and document the data types and content needed to support the project
- Monitor data development by regular review of the process steps completed and recorded within the metadata record
- Provide all project participants a common language of attributes and process methods and a place to record and share progress
- Access the lineage and content of outsourced data production by requiring robust metadata as a contract deliverable

Due to the business demands listed above, metadata continues to increase in value. The proliferation of local governments serving geospatial data as map services extends the use of geospatial data, but makes it imperative that agencies provide compliant metadata in a global environment.

IV. Geospatial Metadata Standards Used to Develop the Profile

Given the increasing number of geospatial metadata standards available and the current shift in the U.S. from the FGDC Content Standard for Digital Geospatial Metadata (CSDGM 1998) to the ISO 191** suite of metadata standards, this profile was developed to be easily applied to most geospatial metadata standards. However, the applicability of the profile to these standards is prioritized as follows:

- ISO 19115 and 19115-1 compliance is achieved by the use of all profile-designated 'required' (green/dark grey) elements
- CSDGM compliance is achieved by the use of all profile elements, 'required' (green/dark grey) and 'optional' (tan/light grey) elements.
- Compliance with other standards is variable and may require additional elements.

V. Implementing the State and Local Government Metadata Profile

The adoption of a new ISO based metadata standard offers an opportunity for agencies that do not currently maintain standardized metadata to engage in compliant practice. Agencies that currently maintain metadata will have an opportunity to transition from their current CSDGM template to the current standard allowing them to document additional data resources (map services, geospatial models and applications).

Implementing or transitioning metadata standards requires guidance. Several resources (listed below) have been developed specifically to help define and implement the state and local government profile:

Table of Metadata Elements

The table of elements lists and defines the specific mandatory and optional (recommended) metadata elements identified by the NC metadata community as necessary for the effective discovery and application of geospatial data resources. Metadata records that include all NC State and Local Government Profile *mandatory* elements comply with the minimum requirements of both ISO 19115 and ISO 19115-1. Metadata records that include *all* NC State and Local Government Profile elements (required and optional) comply with ISO 19115, ISO 19115-1, and the FGDC Content Standard for Digital Geospatial Metadata (CSDGM).

Metadata Implementation Resources

The North Carolina Center for Geographic Information and Analysis has developed a webpage to support implementation of this profile at:

http://www.nconemap.com/DiscoverGetData/Metadata.aspx

The site will provide key resources including:

- The most current version of the NC State and Local Government Metadata Profile document.
- Example local government metadata records, in both CSDGM and ISO formats, that illustrate profile compliant metadata.
- Templates (XML documents) that can be ingested into a variety of metadata editors to serve as a boilerplate for the creation of a profile compliant metadata record. The templates can also be populated with additional content and used as an organizational or project-specific template.
- Links to available metadata editors and related applications.

Additional resources can be added to the website as needed and available.

VI. Recommendations

The Federal Geographic Data Committee (FGDC) currently endorses ISO 19115:2003 - *Geographic information -- Metadata* and is expected to endorse the March 2014 update, *ISO 19115-1:2014 Geographic Information – Metadata – Part1: Fundamentals* once adopted by the American National Standards Institute (ANSI). The FGDC strongly encourages agencies and National Spatial Data Infrastructure (NSDI) Stakeholders to transition from the former federal geospatial metadata standard, *Content Standard for Digital Geospatial Metadata* (CSDGM), to the ISO 191** suite of standards.

In an effort to comply with international standards and federal guidelines, the NCGICC recommends North Carolina state agencies and local governments adopt the ISO compliant *NC State and Local Government Metadata Profile* for cataloging all geospatial data and resources. The resources contained in this document are intended to assist agencies and local governments with the initial implementation of metadata and the conversion from CSDGM for those who currently use the prior standard.

VII. NC Geospatial Metadata Profile Elements

Table 1 - Metadata for Geospatial Data provides a list of metadata elements considered minimal documentation for the discovery, maintenance, and application of geospatial data. For each element, a domain for values is specified and best practices are provided to guide users in the effective use of the metadata element.

Table 2 - Metadata for Geospatial Services provides a list of metadata elements considered minimal documentation for the discovery, maintenance, and application of geospatial services. Services are applications that store, distribute, view, manipulate or otherwise utilize geospatial data such as:

- Geospatial data catalogs such as data.NCOneMap.gov
- Geospatial community workspaces such as Data.gov
- Web-mapping applications
- Online data viewers
- Online data processors

To apply this profile to your geospatial metadata, users should:

1. Open a new or existing metadata record in the application that you use to create and/or edit metadata.
2. Identify the table below that is relevant to the resource for which you are creating the metadata.
    - If you are creating metadata for a geospatial data resource, use Table 1. Metadata for Geospatial Data
    - If you are creating metadata for a geospatial service, use Table 2. Metadata for Geospatial Services
3. As you work down the table, line by line:
    - Find the metadata element in your metadata editor that corresponds to the metadata element listed in the profile.
    - Address all elements in which the 'Element Name' is in a green box (dark grey if printed as black and white).
    - If using the CSDGM standard, also address elements in which the 'Element Name' is in a tan box (light grey if printed as black and white). If using the ISO standard, these elements are optional.
4. Populate the elements based on the best practices guidance provided for each element

To facilitate metadata creation, users are strongly encouraged to develop an organizational metadata template by importing one of the NC State and Local Government Metadata Profile templates provided at http://www.nconemap.com/DiscoverGetData/Metadata.aspx and editing it to include organizational information (contacts, distribution methods, liability statements, etc.).

Table 1 - Metadata for Geospatial Data

Legend:
NC Profile and ISO required
Optional and/or CSDGM required

Element	Domain	NC Best Practice
Title	Free text	• Provide a descriptive, unique, name to convey the nature of the data. At a minimum, address: what, where and when. • Avoid acronyms and abbreviations that are not commonly understood though a filename or other identifying reference can be included *in addition to* the descriptive content. **Example**: *Environmental Sensitivity Index (ESI) Scrub-Shrub and Wetlands, Geographic, Wilmington NC, NAD83, North Caroline Department of Environment and Natural Resources (NCDENR) 2001 [esi_scrub-shrub_wetland_NCDENR_2001]*
Publication Date	Date	• Provide the date that the data was published or otherwise finalized. • Additional, optional, dates can be included to specify the date when the data was first created, a revision date or the other date type as specified by the *Date Type Code* described below • Format = YYYY-MM-DD or YYYYMMDD. If the day is not known, use YYYY-MM. If the month is not known, use YYYY. If the date is not known, use 'unknown' in CSDGM and, in ISO, employ the xml attribute nilReason as a means of entering text in a date only field, e.g. <gmd:date> <gmd:CI_Date> <gmd:date gco:nilReason="unknown"/>

Element	Domain	NC Best Practice
		• Do not specify a range of dates for the publication date, e.g. YYYY-YYYY. • Do not use YYYYMM, which because it is indistinguishable from the incorrect, but still used, YYMMDD.
Date Type	Date Type Code = 'publication'	• ISO metadata only – no need to specify if using CSDGM • Used to designate the type of each *Date* listed • A 'publication' *Date* is required
Responsible Party / Originator	Free text	• Provide the *Organization Name* of the agency that serves as legal custodian of the data • Additional, optional, *Responsible Parties* can be included to specify: – a secondary or more specific office or staff position that serves as a point of contact for questions about the data – collaborating organizations/agencies, vendors who created the data, entities that distribute the data, individuals or agencies that have processed the data, and other responsible parties. • Spell out acronyms and include sufficient information, e.g. parent organizations or state, to uniquely identify the *Responsible Party*. **Examples:** "North Carolina Dept. of Transportation (NCDOT), Division of Highways, Technical Services " "Wake County NC, Geographic Information Services Division"
Responsible Party Role	Role Code = 'custodian' or 'pointOfContact'	• ISO metadata only – no need to specify if using CSDGM • Used to designate the specific role of each *Responsible Party* listed • A 'custodian' or 'pointOfContact' is required

Element	Domain	NC Best Practice
Online Linkage	URL	• Provide a URL address that provides access, preferably direct access, to the data • NC OneMap geoportal requires an online linkage to the data
Abstract	Free text	• Provide a description of the data content and features including data application (GIS, CAD, image, etc.), geographic coverage, time period of content, and special data characteristics, limitations or other information that will aid data consumers in determining if the data is relevant to their intended application. • List most important information first as some applications will display only first 150 – 200 characters of the abstract.
Purpose	Free text	• Explain why the data was created. This element can provide critical context for data that was created for a specific use and may not be appropriate for other, or more general, use
Status	Progress Code	• Indicate the status of the data, e.g. completed, ongoing, planned, etc., as specified by the *Progress Code Codelist* • Indicate 'completed' if the data is finalized and not continually updated. • Indicate 'onGoing' if the data is being actively and continually updated.
Maintenance and Update Frequency	Maintenance Frequency Code	• Indicate the value in the codelist that best describes how often the data is updated • If the status of the data is 'completed': - Indicate 'asNeeded' if staff are available to make as-needed changes (e.g., to correct errors)

Element	Domain	NC Best Practice
		- Indicate 'notPlanned' if staff do not foresee making any changes. • If the status of the data is 'onGoing': - Indicate the most applicable value to describe the known frequency of planned updates • If the frequency of updates is not amongst the codeset values, e.g. every two months, indicate 'periodic'
Browse Graphic Filename(thumbnail)	Free text	• Provide a URL for an available browse graphic image • For best results size the graphic at 200 pixels by 133 pixels, and save it as a PNG, JPEG, or GIF
Browse Graphic File Description	Free text	• Provide a description of the graphic
Browse Graphic File Type	Free text	• Indicate the browse graphic file type, e.g. PNG, JPEG, or GIF
Theme Keywords	Free text	• Provide a robust set of descriptive theme-related keywords • Include broad and specific-terms, e.g. 'wetlands', 'salinity' • Select terms from relevant standardized vocabularies/thesauri when possible • If using CSDGM, include one or more ISO Topic Categories
Theme Keyword Thesaurus	Free text	• Indicate the standardized vocabulary associated with one or more theme keywords, e.g.' Cowardin Wetland Classification', 'GCMD Science Keywords' • Note that thesauri are not limited to formal 'thesauri" and should include informal information documents and publications • Optional and recommended if standardized vocabulary used • Thesaurus requires a 'date' and a 'date type' in ISO 19115. No thesaurus date/date type is required for CSDGM and ISO 19115-1

Element	Domain	NC Best Practice
Place Keyword	Free text	• Provide a robust set of descriptive place-related keywords • Include broad and specific-terms, e.g. 'North Carolina', 'Madison County', 'Marshall' • Include relevant regional references, e.g. 'Appalachia', 'Piedmont'
Place Keyword Thesaurus	Free text	• Indicate the standardized vocabulary associated with one or more place keywords, e.g.' Geographic Names Information System (GNIS)', 'North Carolina Gazetteer' • Note that thesauri are not limited to formal 'thesauri" and should include informal information documents and publications • Thesaurus requires a 'date' and a 'date type' in ISO 19115. No thesaurus date/date type is required for CSDGM and ISO 19115-1
Access Constraints	Free text	• Indicate any restrictions and legal prerequisites for accessing the data, e.g. environmentally sensitive information, personal data, intellectual property
Use Constraints	Free text	• Indicate any restrictions associated with using the data **Examples:** 'The locations in this data were not surveyed and should not be referenced for legal purposes' 'Users are required to read the complete metadata prior to using the data'
Dataset Language	Language Code = 'EN'	'EN' = default / template value unless other
Character Encoding	Character Set Code = 'utf8'	'utf8' = default /template value unless other
Topic Category	Topic Category Code	• Indicate one or more high-level subjects., as specified by the *Topic Category Code* codelist • If using the CSDGM, include one or more topic categories as *theme keywords* and specify the *theme keyword thesaurus* as 'ISO Topic Categories'

Element	Domain	NC Best Practice
Geographic Extent: Easternmost coordinate	-180.0 ≤180.0 degrees longitude	• Format = decimal degrees, longitude
Geographic Extent: Westernmost coordinate	-180.0 ≤180.0 degrees longitude	• Format = decimal degrees, longitude
Geographic Extent: Northernmost coordinate	-90.0 ≤ 90.0 degrees latitude	• Format = decimal degrees, latitude
Geographic Extent: Southernmost coordinate	-90.0 ≤ 90.0 degrees latitude	• Format = decimal degrees, latitude
Temporal Extent of Data Content	Date	• Indicate the date(s) for the content of the data. This value, typically corresponds to the collection, vs. the publication, of the data • This may be a: - single date, e.g. YYYY-MM-DD , YYYY-MM, or YYYY) - series of dates, e.g. YYYY-MM-DD, YYYY-MM-DD, YYYY-MM-DD) - Range of dates, e.g., <gmd:extent> <gml:TimePeriod > <gml:beginPosition>2003-01-18</gml:beginPosition> <gml:endPosition indeterminatePosition="now"/> </gml:TimePeriod> </gmd:extent>
Currentness Reference	'ground condition', 'publication date', free text	• Indicate if the Time Period of Content references that actual ground condition during the time or some, later, publication date, e.g. the actual date of capture of an orthophoto or the delivery date for the orthophoto collection (publication)
Entity /Attribute Description	Free text	• ***At a minimum***, provide a detailed text description of the features and attributes included within the data including definitions of feature and attribute labels

Element	Domain	NC Best Practice
		• ***Preferably***, provide a detailed Entity Attribute Description (CSDGM) or Feature Catalog (ISO 19110) record. The Feature Catalog record may be incorporated into the metadata record, made available via a Citation, or indicated as included with the data
Process Description	Free text	• Provide a description of how the data were created and indicate source data used, where applicable • This is a repeatable element so can be used to provide a single, compiled description or a series of process step descriptions
Process Date	Date (YYYYMMDD)	• Provide a date for the process. This can be a single, multiple or range of dates or 'unknown' or 'not complete'
Logical Consistency Report	Free text	• Provide a description of any assessment performed to test the fidelity of the data attributes (database QA/QC) or the data structure (topological checks, i.e. RMS error)
Completeness	Free text	• Provide a description of the omissions and selection criteria used to develop or generalize the data **Examples:** "Federal Lands excluded" "Municipalities are defined as having populations >2500"
Spatial Reference Information	Free text	• Provide a Spatial Reference System Identifier (SRID)from an authoritative source such as the European Petroleum Survey Group (EPSG), More information at http://spatialreference.org/
Horizontal Coordinate System	(multiple elements/formats)	• Provide one of the following: - Geographic Latitude & Longitude Resolutions, Coordinate Units - Map Projection Name, Parameters, Coordinate Resolution

Element	Domain	NC Best Practice
		- Grid Coordinate System Name, Parameters, Coordinate Resolution - Local Description, Parameters, Coordinate Resolution
Metadata Creation Date	MMMMYYDD	Indicate the date that the metadata record was created
Metadata Date Type	Date Type Code = 'creation'	• Used to designate the type of each *Date* listed • The metadata record 'creation' *Date* is required
Metadata Contact Name	Free text	• Provide the *Organization Name* of the agency that serves as the point of contact for the metadata record.
Metadata Contact Role Code	Role Code = pointOfContact	• Used to designate the specific role of each *Responsible Party* listed • A *Metadata Contact* 'pointOfContact' is required.
Metadata Contact Address: City	Free text	• Indicate the City in which the *Metadata Contact* is located
Metadata Contact Address: Administrative Area (State)	Free text	• Indicate the State in which the *Metadata Contact* is located
Metadata Contact Address: Postal Code	Free text	• Indicate the Zip Code in which the *Metadata Contact* is located
Metadata Contact Telephone	Free text	• Indicate the ten-digit phone number at which the *Metadata Contact* can be reached.
Metadata Standard Name	Free text	• Indicate the metadata standard to which the metadata record is in compliance. **Examples:** "ISO 19115", 'ISO 19115-1", or "ISO 19115-2" "FGDC Content Standard for Digital Geospatial Metadata (CSDGM)"
Metadata Standard Version	Free text	• Indicate the version of the metadata standard used **Examples:** "2003/Cor.1:2006" "1998:Version 2"

Table 2 - Metadata for Geospatial Services

Legend:
NC Profile and ISO required
Optional and/or CSDGM required

Element	Domain	NC Best Practice
Title	Free text	• Provide a descriptive, unique, name to convey the nature of the data. At a minimum, address: what, where and when. • Avoid acronyms and abbreviations that are not commonly understood though a filename or other identifying reference can be included *in addition to* the descriptive content. **Example**: *Environmental Sensitivity Index (ESI) Scrub-Shrub and Wetlands, Geographic, Wilmington NC, NAD83, North Caroline Department of Environment and Natural Resources (NCDENR) 2001 [esi_scrub-shrub_wetland_NCDENR_2001]*
Publication Date	Date	• Provide the date that the data was published or otherwise finalized. • Additional, optional, dates can be included to specify the date when the data was first created, a revision date or the other date type as specified by the *Date Type Code* described below • Format = YYYY-MM-DD or YYYYMMDD. If the day is not known, use YYYY-MM. If the month is not known, use YYYY. If the date is not known, use 'unknown' in CSDGM and, in ISO, employ the xml attribute nilReason as a means of entering text in a date only field, e.g. <gmd:date> <gmd:CI_Date> <gmd:date gco:nilReason="unknown"/>

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		• Do not specify a range of dates for the publication date, e.g. YYYY-YYYY. • Do not use YYYYMM, which because it is indistinguishable from the incorrect, but still used, YYMMDD.
Date Type	Date Type Code = publication	• ISO metadata only – no need to specify if using CSDGM • Used to designate the type of each *Date* listed • A 'publication' *Date* is required
Responsible Party / Originator	Free text	• Provide the *Organization Name* of the agency that serves as legal custodian of the data • Additional, optional, *Responsible Parties* can be included to specify: – a secondary or more specific office or staff position that serves as a point of contact for questions about the data – collaborating organizations/agencies, vendors who created the data, entities that distribute the data, individuals or agencies that have processed the data, and other responsible parties. • Spell out acronyms and include sufficient information, e.g. parent organizations or state, to uniquely identify the *Responsible Party*. **Examples:** "North Carolina Dept. of Transportation (NCDOT), Division of Highways, Technical Services" "Wake County NC, Geographic Information Services Division"
Responsible Party Role	Role Code = 'custodian' or 'pointOfContact'	• ISO metadata only – no need to specify if using CSDGM • Used to designate the specific role of each *Responsible Party* listed • A 'custodian' or 'pointOfContact' is *Responsible Party* required.
Online Linkage	URL	• Provide a URL address that provides access, preferably direct access, to the service

Element	Domain	NC Best Practice
		• NC OneMap geoportal requires an online linkage to the data
Abstract	Free text	• Provide a description of the data content and features including data application (GIS, CAD, image, etc.), geographic coverage, time period of content, and special data characteristics, limitations or other information that will aid data consumers in determining if the data is relevant to their intended application. • List most important information first as some applications will display only first 150 – 200 characters of the abstract.
Purpose	Free text	• Explain why the data was created. This element can provide critical context for data that was created for a specific use and may not be appropriate for other, or more general, use.
Theme Keywords	Free text	• Provide a robust set of descriptive theme-related keywords • Include broad and specific-terms, e.g. 'wetlands', 'salinity' • Select terms from relevant standardized vocabularies/thesauri when possible • If using CSDGM, include one or more ISO Topic Categories
Theme Keyword Thesaurus	Free text	• Indicate the standardized vocabulary associated with one or more theme keywords, e.g.' Cowardin Wetland Classification', 'GCMD Science Keywords' • Note that thesauri are not limited to formal 'thesauri" and should include informal information documents and publications • Thesaurus requires a 'date' and a 'date type' in ISO 19115. No thesaurus date/date type is required for CSDGM and ISO 19115-1

Element	Domain	NC Best Practice
Place Keyword	Free text	• Optional but recommended • Provide a robust set of descriptive place-related keywords • Include broad and specific-terms, e.g. 'North Carolina', 'Madison County', 'Marshall' • Include relevant regional references, e.g. 'Appalachia', 'Piedmont'
Place Keyword Thesaurus	Free text	• Indicate the standardized vocabulary associated with one or more place keywords, e.g.' Geographic Names Information System (GNIS)', 'North Carolina Gazetteer' • Note that thesauri are not limited to formal 'thesauri" and should include informal information documents and publications • Thesaurus requires a 'date' and a 'date type' in ISO 19115. No thesaurus date/date type is required for CSDGM and ISO 19115-1
Access Constraints	Free text	• Indicate any restrictions and legal prerequisites for accessing the data, e.g. environmentally sensitive information, personal data, intellectual property
Use Constraints	Free text	• Indicate any restrictions associated with using the data **Examples:** 'The locations in this data were not surveyed and should not be referenced for legal purposes' 'Users are required to read the complete metadata prior to using the data'
Geographic Extent: Easternmost coordinate	-180.0 ≤180.0 degrees longitude	• Format = decimal degrees, longitude
Geographic Extent: Westernmost coordinate	-180.0 ≤180.0 degrees longitude	• Format = decimal degrees, longitude
Geographic Extent: Northernmost coordinate	-90.0 ≤ 90.0 degrees latitude	• Format = decimal degrees, latitude
Geographic Extent: Southernmost coordinate	-90.0 ≤ 90.0 degrees latitude	• Format = decimal degrees, latitude

Element	Domain	NC Best Practice
Metadata Creation Date	MMMMYYDD	Indicate the date that the metadata record was created
Metadata Date Type	Date Type Code = 'creation'	• Used to designate the type of each *Date* listed • The metadata record 'creation' *Date* is required
Metadata Contact Name	Free text	• Provide the *Organization Name* of the agency that serves as the point of contact for the metadata record.
Metadata Contact Role Code	Role Code = 'pointOfContact'	• Used to designate the specific role of each *Responsible Party* listed • A *Metadata Contact* 'pointOfContact' is required.
Metadata Contact Address: City	Free text	• Indicate the City in which the *Metadata Contact* is located
Metadata Contact Address: Administrative Area (State)	Free text	• Indicate the State in which the *Metadata Contact* is located
Metadata Contact Address: Postal Code	Free text	• Indicate the Zip Code in which the *Metadata Contact* is located
Metadata Contact Telephone	Free text	• Indicate the ten-digit phone number at which the *Metadata Contact* can be reached.
Metadata Standard Name	Free text	• Indicate the metadata standard to which the metadata record is in compliance. **Examples:** "ISO 19115", 'ISO 19115-1", or "ISO 19115-2" "FGDC Content Standard for Digital Geospatial Metadata (CSDGM)
Metadata Standard Version	Free text	• Indicate the version of the metadata standard used **Examples:** "2003/Cor.1:2006" "1998:Version 2"
Metadata Scope	Scope Code = 'service'	• Indicate that the metadata record applies to a 'service' (ISO assumes the metadata is for a dataset unless otherwise specified)
Service Type	Free text	• The type of service that is being documented, e.g. data catalog, web map, data download, data visualization/exploration, metadata transformation, metadata creation and edit

Appendix 1. Code Lists

Date Type Code (Date Type element)

Responsible Party Role Code	Description
creation	when the resource was brought into existence
publication	when the resource was issued
revision	when the resource was improved or amended

Role Code (Responsible Party Role element)

Responsible Party Role Code	Description
custodian	party that accepts accountability and responsibility for the data and ensures appropriate care and maintenance of the resource
pointOfContact	party who can be contacted for acquiring knowledge about or acquisition of the resource

Topic Category Codes (Topic Category element)

Topic Code	Description	Examples
farming	rearing of animals and/or cultivation of plants.	agriculture, irrigation, aquaculture, plantations, herding, pests and diseases affecting crops and livestock
biota	flora and/or fauna in natural environment.	wildlife, vegetation, biological sciences, ecology, wilderness, sealife, wetlands, habitat
boundaries	legal land descriptions.	political and administrative boundaries
climatologyMeteorologyAtmosphere	processes and phenomena of the atmosphere.	cloud cover, weather, climate, atmospheric conditions, climate change, precipitation
economy	economic activities, conditions and employment.	production, labour, revenue, commerce, industry, tourism and ecotourism, forestry,

		fisheries, commercial or subsistence hunting, exploration and exploitation of resources such as minerals, oil and gas
elevation	height above or below sea level.	altitude, bathymetry, digital elevation models, slope, derived products
environment	environmental resources, protection and conservation.	environmental pollution, waste storage and treatment, environmental impact assessment, monitoring environmental risk, nature reserves, landscape
geoscientificInformation	information pertaining to earth sciences.	geophysical features and processes, geology, minerals, sciences dealing with the composition, structure and origin of the earth s rocks, risks of earthquakes, volcanic activity, landslides, gravity information, soils, permafrost, hydrogeology, erosion
health	health, health services, human ecology, and safety.	disease and illness, factors affecting health, hygiene, substance abuse, mental and physical health, health services
imageryBaseMapsEarthCover	base maps.	land cover, topographic maps, imagery, unclassified images, annotations
intelligenceMilitary	military bases, structures, activities.	barracks, training grounds, military transportation, information collection
inlandWaters	inland water features, drainage systems and their characteristics.	rivers and glaciers, salt lakes, water utilization plans, dams, currents, floods, water quality, hydrographic charts

location	positional information and services.	addresses, geodetic networks, control points, postal zones and services, place names
oceans	features and characteristics of salt water bodies (excluding inland waters).	tides, tidal waves, coastal information, reefs
planningCadastre	information used for appropriate actions for future use of the land.	land use maps, zoning maps, cadastral surveys, land ownership
society	characteristics of society and cultures.	settlements, anthropology, archaeology, education, traditional beliefs, manners and customs, demographic data, recreational areas and activities, social impact assessments, crime and justice, census information
structure	man-made construction.	buildings, museums, churches, factories, housing, monuments, shops, towers
transportation	means and aids for conveying persons and/or goods.	roads, airports/airstrips, shipping routes, tunnels, nautical charts, vehicle or vessel location, aeronautical charts, railways
utilitiesCommunication	energy, water and waste systems and communications infrastructure and services.	hydroelectricity, geothermal, solar and nuclear sources of energy, water purification and distribution, sewage collection and disposal, electricity and gas distribution, data communication, telecommunication, radio, communication networks

Progress Codes (Status element)

Progress Code	Description
completed	production of the data has been completed
historicalArchive	data has been stored in an offline storage facility
obsolete	data is no longer relevant
onGoing	data is continually being updated
planned	fixed date has been established upon or by which the data will be created or updated
required	data needs to be generated or updated
underDevelopment	data is currently in the process of being created

Maintenance Frequency Codes (Maintenance and Update Frequency element)

Maintenance Frequency Code	Description
continual	data is repeatedly and frequently updated
daily	data is updated each day
weekly	data is updated on a weekly basis
fortnightly	data is updated every two weeks
monthly	data is updated each month
quarterly	data is updated every three months
biannually	data is updated twice each year
annually	data is updated every year
asNeeded	data is updated as deemed necessary
irregular	data is updated in intervals that are uneven in duration
notPlanned	there are no plans to update the data
unknown	frequency of maintenance for the data is not known

Appendix 2: Standard Publications and Related Documents

ISO 191** Suite of Standards

- *ISO 19115:2003 Geographic Information – Metadata*
  Initial ISO geospatial metadata standard
  http://webstore.ansi.org/RecordDetail.aspx?sku=INCITS%2fISO+19115-2003
  and 2006 addendum
  https://www.iso.org/obp/ui/#iso:std:iso:19115:ed-1:v1:cor:1:v1:en

- *ISO 19115-1:2014 Geographic Information – Metadata – Part1: Fundamentals*
  2014 update to the ISO 19115 standard
  http://webstore.ansi.org/RecordDetail.aspx?sku=ISO+19115-1%3a2014

- *ISO 19115-2:2009 Geographic information - Metadata - Part 2: Extensions for imagery and gridded data*
  2009 extension to the ISO 19115 standard for imagery, gridded and collection-level data
  http://webstore.ansi.org/RecordDetail.aspx?sku=INCITS%2fISO+19115-2-2009%5b2009%5d

- *ISO 19110:2005 Geographic information -- Methodology for feature cataloguing*
  Current ISO standard for documenting entity/attributes
  http://webstore.ansi.org/RecordDetail.aspx?sku=INCITS%2FISO+19110-2005

- *ISO 19119:2005 Geographic information – Services*
  http://webstore.ansi.org/RecordDetail.aspx?sku=INCITS%2fISO+19119-2005
  and 2008 amendment
  http://webstore.ansi.org/RecordDetail.aspx?sku=ISO+19119%2fAmd1%3a2008

Federal Geographic Data Committee Geospatial Metadata Standard

- *FGDC Content Standard for Digital Geospatial Metadata, Vers. 2*
  1998 version of the FGDC CSDGGM metadata standard
  http://www.fgdc.gov/metadata/geospatial-metadata-standards#csdgm

Note: *ISO/ANSI standards are available by purchase only. Look for the less costly 'INCITS' publication/versions of the standards. At this time, the INCITS publication of ISO 19115:2003 is available from ANSI for $60. The ISO version of ISO 19115-1 is available from ANSI for $314 though an INCITS version is expected soon. Agencies are encouraged to make agency-wide purchases that will facilitate access to the standard across the organization.*

General Metadata Guidance

- *FGDC Metadata Quick Guide* – guidance on writing quality metadata
  http://www.fgdc.gov/metadata/documents/MetadataQuickGuide.pdf